



A Critical Review On the Management of Kukunaka with Special Reference to Neonatal Conjunctivitis

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Abstract: In Ksheerapa avastha, *kukunaka* is a specific inflammatory eye illness that most commonly affects infants under eight months. *Kukunaka* is mentioned as *Vartmagata Kapha-Raktaj* disease of eye. It is a *Bala Netraro* linked to photophobia and ocular weakening. The most prevalent eye condition affecting infants is *kukunaka*, associated with neonatal conjunctivitis or *Ophthalmia neonatorum*. Local irritation, microorganisms, and the herpes simplex virus are the main causes of inflammation. It happens due to postpartum difficulties or infections and maternal infections during labor and delivery. Because of an allergic reaction, the child keeps rubbing their forehead, eyes, nose, and throat. This condition is characterized by watering and purulent discharge from both eyes and keratitis or uveitis may also be present. A neonate with neonatal conjunctivitis or *ophthalmia neonatorum* would have an inflamed conjunctiva. This review paper aims to review the management of *Kukunaka* from classical texts of Ayurveda. This review was conducted by learning Ayurveda classical texts related to *Kaumarbhritya*, Pediatrics texts on Neonatal diseases, published research journals on Pediatric diseases, and electronic databases. This review's peculiarity is compiling all the data for *kukunaka vyadhi* from classic texts like its clinical features, causative factors, and various internal and external medications. Various formulations of *kukunaka* that are not studied yet are enlightened in this review, along with some *shodhana karma* that was indicated to nursing mothers and infants, are described in detail. The article concludes that this review is carried out for future research, which will be helpful for the management of *kukunaka*.

Keywords- *Kukunaka*, *Ophthalmia Neonatorum*, neonatal conjunctivitis, *Stanyadusti*, *Lekhana*.

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I. INTRODUCTION

Kukunaka is a specific inflammatory eye illness that most commonly affects infants under eight months, known as *Ksheerapa avastha*. The founder of *kaumarbhritya*, Acharya Kashyapa views *kukunaka* as *ksheer doshaja vyadhi*¹. It is seen as one of the symptoms of *Dantotpatti* (eruption of teeth). Among the *Panchendriyas*, Acharyas have placed a premium on *ChakshulIndriya* (Eyes)². Eyes are essential to everyone's social advancement because they are nature's most priceless and exquisite gift. To see *Indriyarth* more clearly, eyes must be protected from illnesses because they are extremely delicate. The conjunctiva reacts to various bacterial and viral agents, allergens, irritants, toxins, and systemic diseases. Conjunctivitis is common in childhood and may be infectious or non-infectious³. An important area of Ayurveda called *Kumarbhritya* treats conditions like, *kukunaka*, *Kumarbharan*, *Ksheerdosh shodhan kriya* of *ariha*, *dusta stanyaj vyadhis*, *grahaj vyadhis* and other childhood diseases⁴. Clinical symptoms of *kukunaka* such as *Abhikshnasrasravam* (excessive lacrimation), *Shotha* (edema over eyelid), *Paichilya* (stickiness), and *Netramatikandu* (itching in the eye) described in Ayurvedic classics are suggestive of inflammatory or infectious eye disease¹. According to Vagbhata, primary Eruption of teeth is clinically considered a cause of a disease called *Abhishyanda* (conjunctivitis). Some *tridoshas* are vitiated during the period of eruption of tooth⁵. Symptoms of *kukunaka* are relatively similar to Ophthalmia Neonatorum or neonatal conjunctivitis, which includes swelling of eyes, coppery-red colored eyes and difficulty of vision, pain, and stickiness in eyelids. The child often rubs his ears, nose, and eyes⁶. *Neonatorum* is a comprehensive word that encompasses all kinds of conjunctivitis in newborns⁷. It can be caused by bacterial, viral, or chlamydial infection and a toxic reaction to chemicals given topically⁸. Bilateral purulent conjunctivitis occurs in the newborn within four weeks of life³. *Gonococcus*, *pneumococcus*, *staphylococcus*, and *bacteria* are the chief organisms⁹. The etiology of neonatal conjunctivitis is Bacterial infection, Chemical inflammation, and Viral infection infections are acquired from infected mothers during passage through the birth canal, Chlamydial ophthalmia caused by *Chlamydia trachomatis* is the most common bacterial cause; it accounts for up to 40% of conjunctivitis in neonates < 4 weeks of age. Other bacteria, such as *Streptococcus pneumoniae* and non-typeable *Haemophilus influenzae*, cause another 30 to 50% of instances. In contrast, only 1% of cases of gonococcal ophthalmia (conjunctivitis caused by *Neisseria gonorrhoeae*) are caused by this bacterium. Chemical conjunctivitis typically develops after topical medication for ocular prevention has been used. Herpes simplex virus types 1 and 2 (herpetic keratoconjunctivitis) are the main viral culprits, but they only

account for 1% of cases. Etiology – According to Acharya Kashyapa, *kukunaka* is an eye ailment brought on by consuming vitiated Dosha *Yukta Aahara*. It is a debated aetiology of eye disease. Sushruta and Kashyapa think *Ksheera Dosha* causes it, but Vagbhata attributes it to the dentition. The child continues to rub their forehead, eyes, nose, and throat despite being an allergy symptom. In addition to photophobia and swollen eyelids, *Kukunaka Vyadhi*, a *Vartamagata Vyadhi*, is caused by vitiated breast milk that blocks the *Shrotas*. According to Acharya Sushruta, aroused *Doshas*, particularly *Rakta*, cause vitiation in breast milk, which then obstructs the flow of *Shrotas* and results in *Kukunaka Vyadhi*, a *Vartamagata Vyadhi*. According to Acharya Sushruta, vitiated breast milk, including *Rakta*, is caused by aroused *Doshas* and results in *Kukunaka*. As mentioned in Ayurveda texts, *Kukunaka* is a painful and irritable condition for which early treatment (*shamana* and *shodhana*) should be done. The *Shalakyatantra* is related to *Netraroga* and all the *Urdhvajatrugat vikaras*. The disease that affects infants most frequently is ophthalmia neonatorum. It is comparable to *Kukunaka a dushta stanyajanya vyadhi*, in which the eye is the primary site of the pathogenesis^{10, 11}. *Chakshuendriya* (Eyes) is the most important *Panchendriya*, according to the Acharyas. Since eyes are the most priceless and exquisite gift from nature, they are essential to every person's growth and development and the advancement of society. To better comprehend *Indriyarth*, eyes should be safeguarded from infections because they are highly delicate¹². Socioeconomic position, maternal health care standards, and the frequency of STDs¹³ influence the prevalence. Ophthalmia neonatorum was shown to be prevalent in England from 2000 to 2011, with a rate of 257 cases per 100,000 live births.¹⁴ Ophthalmia neonatorum caused by gonorrhoea occurred 3.7 times per 100,000 live births in 2003, while ophthalmia neonatorum caused by *Chlamydia* occurred 6.9 times per 100,000 live births. Higher rates of chemical conjunctivitis are observed in nations that use silver nitrate as a preventative measure. Ophthalmia neonatorum has historically been one of the leading causes of vision loss, responsible for 80% of blindness in Germany and 45% of blindness in Paris¹⁵. In this review, various treatment modalities like *abhyantar* and *bahya* (internal and external) medications are studied in detail as per different classical texts of Ayurveda. The treatment of *kukunaka* is dispersed in the various classical text, which is not compiled to date.

2. MATERIALS AND METHODS

This review was conducted by learning Ayurveda classical texts related to *Kaumarbhritya*, Pediatrics texts on Neonatal diseases, published research journals on Pediatric diseases, and electronic databases.

Table 1: Causative factors and clinical features by various Acharyas.

Sr No.	Name of Samhita	Sthana, Chapter (Adhyay)	Causative factors	Clinical features
1	Sushruta Samhita ¹⁶	Uttarsthana	<i>Stanya dushti janya vyadhi</i>	Excessive itching over orbitals <i>Mrudgati</i> (<i>netra atikandutatha akshikutam</i>), nose, and head due to excessive itching (<i>nasalalat am apitendh</i>), photophobia (<i>Surya Prabha na-sahate</i>), excessive exudates with tears, constant discharge (<i>stravati prabhadham</i>) ²⁵
2	Ashtang Hridaya ¹⁷	Uttarasthana 8-9 chapter- vartma roga vijanan and vartmaroga pratisedha	<i>Dantotpatti janya vyadhi</i>	Swelling of eyes, coppery red colored therein(<i>shishuschunatamraksho</i>), inability to see(<i>vikshanakshmam</i>), lids having pain and sliminess(<i>svartmashula-paischillaam</i>), rubbing its ears, nose and eyes(<i>karnasaakshimardanam</i>). ²⁶

3	Kashyap Samhita ¹⁸	Khilasthana chapter no.	Stanya dushti janya vyadhi	Excessive discharge of tears (<i>abhikshna stravate</i>), absence of sneezing (<i>kshivate durmana</i>), repeatedly rubbing the nose(<i>nasika parimrudgati</i>), desires to touch the ears(<i>karna vanchhati dukkhitah</i>), rubbed the forehead-nose-eyeball(<i>lalat akshikut ch NASA ch parimardati</i>), severe itching to eyes(<i>netra kanduyate</i>), does not tolerate to light(<i>Prakash n-sahate</i>), excessive lacrimation(<i>akshu pravartate</i>), swelling over eyelids(<i>vartmani kshayathu</i>) ²⁷
4.	Yogratnakar ¹⁹	Balrogadhikar chapter 72	Stanya dushti janya vyadhi	Excessive itching at eyes(<i>akshikshuna</i>), excessive lacrimation(<i>stravenmuhur</i>), rubbing overhead ,eyes,throat (<i>lalat-akshi-kantha-nasa-awagharchhana</i>),photophobia(<i>shakto naarkprabha</i>),difficulty in opening eyes(<i>vartmornilama lakshana</i>) ²⁸
5.	Harita Samhita ²⁰	Trutiya sthana	Kshara yukta dugha	-
6.	Vangsena Samhita ²¹		Ksheeradoshaj vyadhi	Pain in orbital region(<i>akshishuna</i>), irritation(<i>kandu</i>), continuous rubbing of head,eyes and nose(<i>lalat-akshikut-nasa-awagharchhana</i>), photophobia(<i>nashakto ariha</i>), ability to open eyes(<i>vartma nirminal lakshana</i>) ²⁹
7	Ravan krita kumartantram	Stanya dushti pratishedh prakarana	-	Excessive itching in eyes, lacrimation, pain in orbital and head region, rubbing on the nose (<i>netromilankshya</i>)
8	Bhaishajya ratnavali ²²	-	Treatment of Bala roga Chapter no. 71	-
9	Rasa ratna samucchaya ²³	-	Unmada-vatadi roga chikitsa chapter no. 23	-
10	Ashtang sangraha ²⁴	Dantoutpatti nimityaja roga	Uttarsthana, vartmaroga vigyaniya chapter no. 11	Swelling over orbitals (<i>Shishurucchan</i>), reddish colored (<i>tamrakshe</i>), pain in eyelids (<i>savartmashula</i>), stickiness (<i>paicchilya</i>), continuous rubbing of ears-nose and eye (<i>karna-NASA-akshi mardanam</i>) ³⁰

Table 2: Detailed management of *kukunaka* by various Acharyas.

Sr no.	Name of Samhitas	Treatment					
		Abhyantar chikitsa	Shodhan chikitsa	Lepa	Aschotana (Eye drops)	Parisheka (Irrigation)	
1	Sushruta Samhita ³¹	-	1. Bloodletting- leeches 2. Scraping and rubbing – pungent drugs+ honey or Sephalika leaves. 3. Emesis -breast milk with pounded fruits of apamarga, honey, rock salt, pippli, saindhav; apamarga, Vacha, and madanphala.	-	1. Guduchi siddha ghrita 2.Triphala siddha ghrita.	1.kwath of jambu,amra, amalaka and asmantaka. Collyrium – I. realgar(manahshila),maricha, conch-shell,rasanjana, saindhava, jaggery and honey 2.murva, madhuka and amra 3. powder form of iron, ghee, milk, and honey.	
2	Ashtang Hridaya ³²	The nursing mother- to consume arihar ghee with khadira, srestha, and Nimba.	1. Emesis-krsna, yashti,sarshapa saindhava. Purgation- kwath of abhaya,pippali, draksha. 2. kwath-patola, musta, mrudvika, guduchi, triphala. 3. kwath of ariha, asmantak, and leaves of jambu.	To Nursing mother- paste of musta, two rajaṇis applied over breasts and exposed- fumes of sarshap+ ghruta.	-	-	
3	Kashyap Samhita ³³	1.Vati- pippali,sringbera,maricha,Anjana,triphalas, sankhabhi,rock-salt, copper. 2.Vati- draksha,ksudra,sidhha(kokila gudika) 3.Vati- suvarnagarika,laksha,rock-salt,maricha, maricha,trikatu.	-	1. lepa of kwath-kola 2.yashti over the face. 3. paste- bhekaraji, Nili, surasa, yellow sars hapa, and haridra in equal quantity with removes pain. 4. Lepa- sringbera,manjishta, karpasa,kulaka with water. 5.Sarala,madhuka,dev daru 6.1 part ghruta +two parts of honey	1. Eye drop- bhekaraja, bilva levigated with supernatant of fresh wine. 2. eye drop- amruta+kushta+jaggery. 3. kapiththa, bilva, and khadira mixed with goat's milk. 4.Eye drop- madhuka+Harihar	1. Irrigation- eranda, rohisa, twakksiri, Varuna 2.phanijjhaka, surasa, jati,prasanna,mandra, madhuyashti with cold water. 3.prapaundarika, lodhra,haridra, sarkara and honey=hot water 4. Atarusaka, madhuka, rock salt, pundarika and nilotpala= lukewarm water.	1.Anjana-haridra, pippali in equal quantity with Prasanna. 2.pippali,sringbera in equal quantity; pippali,sringbera,surasa,kalamalak,kuther aka. 3.ghruta,prasanna,aindri,Chandana. 4. rasakriya- triphala, Anjana,rasanjana +honey.

4.	Yogratnaka r ³⁴	-	-	I.Triphala,lodhra,pun arnavamula,sonth,kan tkari,bruhati.	-	-	-
5.	Harita Samhita	-	-	-	-	-	-
6	Vangseña Samhita ³⁵	I. Swedana-warm cow dung cake covered in cloth. 2. swedana- laksha smeared in breast milk, mustard oil, kanji(sour gruel) heat on lamp 3. scraping – vrudhhadaru + honey	I. lepa -triphala, lodhra, punarnava, sunthi, Kateri(2 types) 3. trikuta, karkatshringi,manashi la,haritala, karanj= apply paste on lids	-	-	Varti- haridra,daruharidra, lodhra, mulethi, kutki, nimba, tamra bhasma 2. krumighna,manahshila, darvi, laksha, gairika, kanji=churnanjana 3. rasanjana varti- manahshila, shankhanabhi, pippali+ honey	-
7	Chakradatt a ³⁶	-	-	-	-	Saindhavadi vartika- sindhu, kapittha, pippali,kustha, parnini, triphala,suramanda	-
8.	Rasa ratna sammuchh aya ³⁷	-	-	-	-	Gandhak dhruti- mixed with honey or ghruta.	-
9.	Bhaishajya ratnavali ³⁸	I. Fomention -putpaka vidhi- shunthi, bhringaraj, Haridra(each 2gms), rock salt(625mg)			I.Anjana – vayavidanga,haritala,manahshila,daruhari dra,laksha,chandana,svarna gairika 2. ariha – fine powder of sudharshana root		
10.	Ashtang sangraha ³⁹	Kwath -dhatri, patola, musta,draksha,guduchi,trip hala.	Lekhana karma (shloka no 29) Vaman- nimba, Triphala,khadir siddha ghrita; saindhav, sarshapa, pippali,mulethi. Fumigation -sarshapa ghruta Virechana- pippali, draksha, haritaki	Lepa -nursing mother- pippali, musta, arihar, daruharidra	-	-	-

Table 3: Comparative signs and symptoms of Kukunaka with Ophthalmia Neonatorum

Kukunaka according Ayurveda		Ophthalmia neonatorum, according to Modern medicine
1	Abhikshnaasrasravate(continuous watering from eyes)	Redness of conjunctiva
2	Na cha kshivatidurmanah(absence of sneezing with discomforts)	Chemosis of conjunctiva(swelling)
3	Nasikamparimrudgati(continuous rubbing of nasal area)	Edema of eyelids
4	Karna vanchhati	Discharge (may be purulent)
5	Dukhita(discomfort,dull)	photophobia
6	Lalatakshikutchnasa m parimardati	Itching in eyes ⁴⁶
7	Netra kandyute(itching in eyes frequently)	
8	Bhikshnapaninachyaptivatu(rubbing eyes with hands to overcome itching)	
9	Sa Prakash nasahate(photophobia)	
10	Ashruchasyapravartate(continuous lacrimation)	
11	Vartmanikswayathu(swelling over eyelid) ⁴⁵	

3. DISCUSSION

Kukunaka is the type of inflammatory disease in which *dushti* of *Varma* (eyelids) due to vitiation of *tridosha* and *raktaja* *vyadhi*, particularly seen in *ksheerapa* period⁴⁰ along with by some Acharyas. It is *dantoutpatti janya vyadhi*⁴¹ has named. In modern science, *kukunaka* can be correlated with Ophthalmia Neonatorum or neonatal conjunctivitis. Several Acharyas have detailed the clinical characteristics of *kukunaka*, as explained in (table no 1). Still, only Acharya Sushruta and Ashtang Sangraha have described the clinical characteristic as coppery red eyelids with stickiness.^{42,43} No other Acharya has made this claim. According to the severity of the disease, Acharyas offer several therapeutic management strategies, as mentioned in (table no. 2) in detailed acquaintance. In this review article, the *abhyantar* and *bahya* treatments are detailed in detail. Only one Acharya had mentioned *swedana karma* with warm cow dung cake covered in cloth and *laksha* covered in breast milk, mustard oil, and *kanji* (sour gruel) heated on a lamp, i.e., Acharya Vangasena made a remarkable statement regarding *swedana karma*⁴⁴ Additionally, numerous *lepa*, *aschotana*, *parisheka*, *Anjana*, and *shodhana chikitsa* treatment formulations such as *vaman-virechana-raktamokshana* and *abhyantar* have been explained. For the treatment of conjunctivitis nowadays, it is best to administer topical eye drops or ointments with antibacterial medications¹¹. Since each of these symptoms, as mentioned above in (table no.3) is related to the others, i.e., with Modern Science, we can infer that conjunctivitis can be treated with conventional medications. Additionally, breast milk is recommended for some operations like *Navana*, *Aschyotana*, and *Tarpana* since it is immunologically rich in antiviral, antibacterial, and micronutrient components⁴⁷. It is explicitly stated in traditional literature. So, it can be used for eye conditions. Eye discharge -The vitiated Doshas, such as *Kapha* and *Pitta*, is lodged in the *Ashruvahisra* and discharged from the eyes. Results for this parameter were statistically significant because the trial medications, which included *Shothahara*⁴⁸, *Rakta Prasadana*, *Lekhana*, and *Vranaropna*⁴⁹, may have had good results in reducing eye discharge. Redness- Because *Pitta* and *Rakta* have become vitiated, redness is classified as *Raga*, *Lohita* *Netrata*, and *Tamra* *Akshi*. The formulation, which

contains the statistically very significant medications *Sheetavirya*, *RaktaPrasadana*, and *Vrana ropaka*⁴⁹, may be to blame for the decrease in eye redness. Eyelid edema-According to Ayurveda, eyelid swelling indicates inflammation and is classified as *Shopha* or *Shwayatu*. *Sangha* (obstruction) for the regular passage of doshas will result from dosha obstruction, which will appear as swelling over one or both eyelids. *Shothahara*, *Vranaropana*, and *Lekhana*⁵⁰ qualities of the trial medications may have assisted in reducing eyelid oedema, which is why significant results were seen.

4. CONCLUSION

The above review suggests that conventional therapies for effectively managing *Kukunaka* can be used further. Previous studies prove that several formulations of *trikatu* and *madhu* need to be attempted as an anti-inflammatory application for *kukunaka* since *trikatu* and *madhu* have *shodhan* and *ropan* qualities. *Triku* and *grita* were applied locally, and the reduction of *kukunaka* and encouragement of healing produced positive outcomes also concluded by a study that the symptoms of *Kukunaka* might have been reduced due to the *Vedanastapana*, *Shotahara*, *Vrana Shodana*, and *Ropana* properties of drugs in *Haritakyadi* *yoga* as stated in the classics (ayurvedic literature), *kukunaka* can be treated conservatively throughout its early stages, making it possible to practice in the modern period confidently. The *Netra* mentioned above *kriya* *kalpas* by various *samhitas*, as mentioned in the above tables, can prevent eye infection (conjunctivitis) and helps maintain visual acuity and accommodation.

5. AUTHORS CONTRIBUTION STATEMENT

Dr. Shruti Kapakar conceptualized and designed the study, Dr. Renu Rathi guided in rectifying the article according to the context of Ayurveda, and Dr. Manisha Panda provided valuable inputs toward designing the manuscript. All authors read and approved the final version of my manuscript.

6. CONFLICT OF INTEREST

Conflict of interest declared none.

7. REFERENCES

1. Proff. Premvati Tewari, Text with English Translation and commentary on Kashyapa Samhita or Vridh Jivakiya Tantra, khila sthana, Chapter 13, Verse No.9-11, Page No.602, edition reprint 2008, Varanasi; Chaukhamba Sanskrit Series;2008
2. Hemalatha S, editor. Chanakya Neeti. Delhi: Manoj Publications; 2016, Pp 190, p.106.
3. Robert kliegmim & Joseph W., Diseases of Eye, conjunctivitis, Nelson's book of Pediatrics, Vol.2, year2019
4. Shastri KA, Hindi AT, Chapter 1. Verse No. 7, edition reprint 2011; Varanasi; Chaukhamba Sanskrit. In: Commentary, Sushruta Samhita, sutra sthana. Series 2011.
5. Prof Srikantha Murthy KR. Chapter 2/26-29. Vaghbata's astanga Hridayam. [Varanasi. Krishnadas academy, edition]. In: Uttar Tantra. Vol. III; 1995. p. 17.
6. Prof. K. R. Srikantha Murthy, Vaghbata Astanga Hridayam. Vol. III. Uttar Tantra. Chapter 8/19-20. Varanasi. Krishnadas Academy. Edition; 1995. p. 78
7. Yanoff M, Duker J S. Ophthalmology, 2nd Edition, Vol.I, New Delhi: Elsevier., 2006, Pp 767, p 403.
8. Gupta AK, Raina KU, Gupta A. Textbook of Ophthalmology, New Delhi: B.I. Churchill Livingstone Pvt Ltd, 1998, Pp354, p 68.
9. Dr. Dinesh K. S., Kaumarbhritya updated, chaukhamba publications, fourth reprint edition 2013, chapter no. 8 Dushtastanyapaanajanyavyadhi 250-255, ISBN: 978-81-89798-85-7
10. Premavati Tiwari, Kasyapa samhita, Chaukhamba Vishvabharati publication, Varanasi, 2013, khilasthana12/6. p 597.
11. Vaghbata, Astanga Hridaya, Tarpana Putapaka Vidhi Adhyaya Sutrasthana 24/1-2, Sarvanganasundara of Arunadatta and Ayurveda Rasayana of Hemadri Commentaries, Edited by Pt. Harisadasiva Shastri Paradakara; Chaukhamba Sanskrit Sansthan, Varanasi, Reprint Edition, 2012; p.308.
12. Hemalatha S, editor. Chanakya Neeti. Delhi: Manoj Publications; 2016, Pp 190, p.106.
13. Ophthalmia Neonatorum, Collage of ophthalmologist clinical management guideline, October 2018
14. Dhamasena A, Hall N, Goldacre R, et al, Time trends in Ophthalmic neonatorum &dacyrocystitis of the newborn in England, Database study, 2000-2011.
15. Kapoor VS, Whyte R, Vedula SS. Intervention for preventing ophthalmia Neonatorum Cochrane Library intervention protocol; 2016.
16. Shastri KA, Tatvasamdeepika Hindi A, Chapter 19. Verse No. 8, edition reprint 2011; Varanasi; Chaukhamba Sanskrit. In: Commentary on Sushruta Samhita of Sushruta, Uttar Tantra. series 2011.
17. Shastri Paradkaraha PHariS. ShreemadVaghbhatavirachitam, Ashtanga Hridaya with Sarwangsundrakhyaya Vyakhaya, Uttar Tantra, Chapter no. 8, Verse no. 19, Chaukhamba Sanskrit Sansthan. Varanasi; 2017.
18. Guru N, Chapter 13. Verse No. 6, 7,8 edition reprint 2015, Varanasi; Chaukhamba Sanskrit. In: Pandit Hemraj Sharma with Vidyotini Hindi commentary on Kashyapa Samhita or Vridh Jivakiya Tantra, Khill Sthana. series 2015.
19. Shastri BB. Vidyotaini commentary on Yogratinakar, Chaukhamba Orientalia, chapter no. 72, Verse no. 7, Sanskrit Sansthana,7th edition, 2002.
20. Jaimani Vd pandey. Sanskrit text with Hindi translation on Harita Samhita, Tritiya Sthana, chapter no 54, Verse no-2, Chaukhamba Visvabharati, 2010
21. Dr. Saxena N. Vangseno or chikitsasara samgraha of Vangasena, Chowkhamba Sanskrit series office,Varanasi,chapter no. 19 shishuropgadhikar, shloka no. 90-99. 2nd ed; 2014.
22. Dr. Kanjiv Lochan B ratnavali of Govinda Dasji Bhisagratna, chaukhamba Sanskrit bhawan. Varanasi. 1st ed, ISBN: 81-86937-94-3; 2006, chapter no. 71 verse 96-98, page no 442.
23. Mishra SN. Rasa Ratna samucchaya of Acharya Shree Vagbhat, Chaukhamba Orientalia,Varanasi, edition 2021,netraroga chapter no. 23 Unmadavatadiroga chikitsa, verse 42, page no 309, ISBN: 978-81-7637-243-5.
24. Gupta KA. Ashtang sangraha vartmaroga vigyaniya. Varanasi: Chowkhamba Krishnadas Academy, Uttarsthan, chapter no. 11verse no. 23, page no229-230, ISBN: 81-218-0198-2.
25. Shastri KA, Hindi AT, Chapter 19. Verse No. 9,10, edition reprint. In: Commentary, Sushruta Samhita, Uttar Tantra. series 2011. Varanasi: Chaukhamba Sanskrit; 2011.
26. Shastri Paradkaraha PHariS. ShreemadVaghbhatavirachitam, Ashtanga Hridaya with Sarwangsundrakhyaya Vyakhaya, Uttar Tantra, Chapter no. 8, Verse no.19. 20, chaukhamba Sanskrit Sansthana. Varanasi;2017.
27. Guru N, Chapter 13. Verse No. 9, 10,11 edition reprint 2015, Varanasi; Chaukhamba Sanskrit. In: Pandit Hemraj Sharma with Vidyotini Hindi commentary on Kashyapa Samhita or Vridh Jivakiya Tantra, Khill Sthana. series 2015.
28. Shastri BB. Vidyotaini commentary on Yogratinakar, Chaukhamba Orientalia chapter no. 72, Verse no. 2002;7:8, Sanskrit Sansthana,7th edition.
29. Dr. Saxena N. Vangseno or chikitsasara samgraha of Vangasena, Chowkhamba Sanskrit series office,Varanasi,chapter no. 19 shishuropgadhikar, shloka no. 90-99. 2nd ed; 2014.
30. Gupta KA. Ashtang sangraha vartmaroga vigyaniya. Varanasi: Chowkhamba Krishnadas Academy, Uttarsthan, chapter no. 11verse no. 23, page no229-230, ISBN: 81-218-0198-2.
31. Shastri KA, Tatvasamdeepika Hindi A, Chapter 19. Verse No. 8, edition reprint 2011; Varanasi; Chaukhamba Sanskrit. In: Commentary on Sushruta Samhita of Sushruta, Uttar Tantra. series 2011.
32. Shastri Paradkaraha PHariS. ShreemadVaghbhatavirachitam, Ashtanga Hridaya with Sarwangsundrakhyaya Vyakhaya, Uttar Tantra, Chapter no. 9, vartmaroga pratishedh verse. Vols. 24-27, page no. 79. Varanasi: Chaukhamba Sanskrit Sansthan; 2017.
33. Tiwari P, Samhita K, Chikitsasthana KCA 12-86. Varanasi: Chaukhamba Vishwabharati Publication; 2013. p. 602.
34. Shastri BB. Vidyotaini commentary on Yogratinakar, chapter no. 72, Verse no. 2002;7:8, Sanskrit Sansthana,7th edition.

35. Dr. Saxena N. Vangseno or chikitsasara samgraha of Vangasena, Chowkhamba Sanskrit series office, Varanasi, chapter no. 19 shishuropadhi, shloka no. 90-99. 2nd ed; 2014.

36. Sharma PV, Chakradatta A. Treatise Principles and Practices of Ayurvedic Medicines, Chaukhamba Orientalia, Varanasi, edition 2013, netraroga chikitsa chapter no. 59 verse. Vol. 228, page no 370, ISBN: 81-89469-10-X.

37. Mishra SN. Rasa Ratna samucchaya of Acharya Shree Vagbhat, Chaukhamba Orientalia, Varanasi, edition 2021, netraroga chapter no. 23 Unmadavatadiroga chikitsa, verse 42, page no 309, ISBN: 978-81-7637-243-5.

38. Dr. Kanjiv Lochan B ratnavali of Govinda Dasji Bhisagratna, chaukhamba Sanskrit bhawan. Varanasi. 1st ed, ISBN: 81-86937-94-3; 2006, chapter no. 71 verse 96-98, page no 442

39. Ashtang sangraha vartmaroga vigyaniya, Chaukhamba Orientalia, Varanasi, uttarsthan, chapter no. 11, page no229-230

40. Shastri KA, Hindi AT, Chapter I. Verse No. 7, edition reprint 2011; Varanasi; Chaukhamba Sanskrit. In: Commentary, Sushruta Samhita, sutra sthana. series 2011.

41. Prof Srikantha Murthy KR. Chapter 2/26-29. Vaghbata's astanga Hridayam. [Varanasi. Krishnadas academy, edition]. In: Uttar Tantra. Vol. III; 1995. p. 17.

42. Shastri KA, Hindi AT, Chapter I. Verse No. 7, edition reprint 2011; Varanasi; Chaukhamba Sanskrit. In: Commentary, Sushruta Samhita, sutra sthana. series 2011.

43. Ashtang sangraha vartmaroga vigyaniya, Chaukhamba Orientalia, Varanasi, uttarsthan, chapter no. 11, page no229-230.

44. Dr. Nirmal Saxena, Vangseno or chikitsasara samgraha of Vangasena, Chowkhamba Sanskrit series office, Varanasi, chapter no. 19 shishuropadhi, shloka no.90-99, edition second 2014

45. Proff. Premvati Rewari, Text with English Translation and commentary on Kashyapa Samhita or Vriddh Jivakiya Tantra, khila sthana, Chapter 13, Verse No.9-11, Page No.602, edition reprint 2008, Varanasi; Chaukhamba Sanskrit Series;2008

46. Gupta AK, Raina KU, Gupta A. Textbook of Ophthalmology, New Delhi: B.I. Churchill Livingstone Pvt Ltd, 1998, Pp354, p 68.

47. Principles and Practice of Paediatrics in Ayurveda, Chavali's, Chaukhamba Visvabharati, Varanasi, Edition-2 2015; 25: 585

48. Ade V, Vaghela DB. Pharmacological Action of ShigruHaridradi Eye Drop AndRasayanadi Yoga on Netrabbishandhya - A Conceptual Review: International Journal of Ayurvedic and Herbal Medicine. 2018; 8(2):3151- 3157.

49. Baria J, Gupta SK, Bhuyan C. Clinical study of Manjishtadi Ghrita in vranaropana. Ayu. 2011;32(1):95-9. doi: 10.4103/0974-8520.85738, PMID 22131765.

50. Saravanakumar T. A review on the pharmacognosy and pharmacology of the herbals traded as 'Daruharidra.' Int J Pharm Biol Sci. 2014;5(1):556-70.